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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/446,471	03/24/00	ZHANG	L IOLL-281

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EXAMINER

FORTUNA, A

ART UNIT	PAPER NUMBER
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1723

DATE MAILED: 03/14/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

# Office Action Summary

Application No.

09/446,471

Applicant(s)

Zhang

Examiner

Ana Fortuna

Group Art Unit

1723



☒ Responsive to communication(s) filed on Mar 24, 2000

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claims

☒ Claim(s) 1-23 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 1-23 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been  
☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☒ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 5

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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### DETAILED ACTION

1. Claims 1-11 recites the limitation "step b" in claim 1 line 9. There is insufficient antecedent basis for this limitation in the claim. In claim 5, line 1, the term "oxidizing" has not bases in the previous claims, since the term has been deleted from claim 4.
2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --
3. (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
4. Claims 1, 3, 4, 12, 14, 15, 16, 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Tanabe et al. (5,833,846) (Tanabe). Tanabe discloses a method as claimed including treatment of water containing ionic organic impurities with an apparatus including electro-dionization, ultraviolet radiation, e.g. oxidizing agent, and chemically regenerated ion exchange apparatus, e.g. ion exchange polisher (Figure 1, elements (106, 108, 109, column 2, lines 23-68, column 3, lines 1-31).

### *Claim Rejections - 35 USC § 103*

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 2, 13, 5, 8, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanabe et al. (5,833,846)(Tanabe) as applied to claims 1, 3, 4, 12,14, 15, 16, 18 above further in view of White (5,116,509). Tanabe fails to disclose the wave length of UV light applied in the oxidizing process or in the apparatus. It is conventional in the art to apply wave length of 184.9 nanometers in order to effect oxidation of organics in water and removal of TOC. White as to claim 2 discloses as conventional the treatment of water by combination of ultraviolet treatment at the wave length claimed and deionization and recirculating the water between the two steps a plurality of times ( column 1, lines 1-62). White also discloses the substitution of deionization by electrodeionization, the combination of the electrodeionization treatment with other process , e.g. Reverse osmosis, ultrafiltration, ion exchange is also disclosed (column 2, lines 1-26, column, column 2, lines 59-68, column 3, column 4, lines 1-66). White also discloses the combination of the first apparatus and second apparatus as claimed in claim 2 in a second embodiment, e.g. electrodeionization -ion exchange, (column 3, lines 26-37).

7. Claims 1-4, 6, 7, 12-16, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawai et al (4,863,608) in view of Capiela et al.(4,676,908). Reference 608 discloses the process of treating and purifying water including reverse osmosis, ultraviolet light radiation and ion exchange, and further discloses the combination of ultraviolet light with catalyst for improving removal of carbon contaminants (column 1, lines 37-68, column 2, lines 1-11, column

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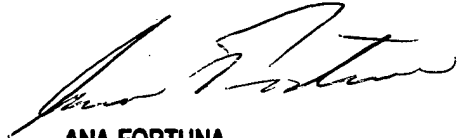
3, lines 51-68). The combination with electrodialysis or electroionization is not disclosed. Reference '908 discloses reverse osmosis as equivalent to reverse osmosis for the purpose of removing carbonate or ionic species in water to be treated (column 5, lines 26-36, column 6, lines 37-42). It would have been obvious to one skilled in the art at the time the invention was made to alternatively select the combination of UV light treatment electrodialysis or reverse osmosis UV treatment for the removal of ionized carbon compounds, as suggested by '908 in a process of purifying water (column 8, lines 49-52).

8. Claims 1-6, 10, 12-19, 21-~~23~~ are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 61101292 and JP 53149873 or Copper et al (5,118,422) Reference '292 discloses the apparatus and process of removing organic substances from water, the process includes radiation, ion exchange, second radiation and second ion exchange, therefore, the combination of claim 2 having the first and second apparatus in the same apparatus is disclosed (abstract) Reference '873 discloses removing organic matter including UV treatment in presence of hydrogen peroxide, and further treatment with ion exchange after the reverse osmosis (abstract), it would have been obvious to one skilled in the art at the time the invention was made to substitute reverse osmosis by electrodialysis, since they are considered to be equivalent for removing organic matter, e.g. Carbon compounds or ionic matter from water. Reference '422 discloses the treatment of permeate from reverse osmosis membrane by ultraviolet radiation driven by and photocatalytic posttreatment (abstract), and further discloses the UV light of 185 nm, and the generation of hydrogen peroxide in the process is also disclosed (column 4, lines 51-63). Therefore, it would

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have been obvious to one skilled in the art at the time the invention was made to combine conventional equivalents oxidation process either as pretreatment or posttreatment in a reverse osmosis or electrodialysis water treatment process, e.g. for elimination carbon components in ionic of ionized form and improve separation efficiency of the separation in the first and or second separation steps or apparatus unit.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ana Fortuna whose telephone number is (703) 308-3857. Facsimile No. (703)305-7718.

  
ANA FORTUNA  
PRIMARY EXAMINER  
GROUP 1300  
1723

Ana Fortuna

March 12, 2001